Clarion

SERVICE MANUAL

Closer Relations through "CLARION SERVICE MANUAL"

MODEL GT-501E

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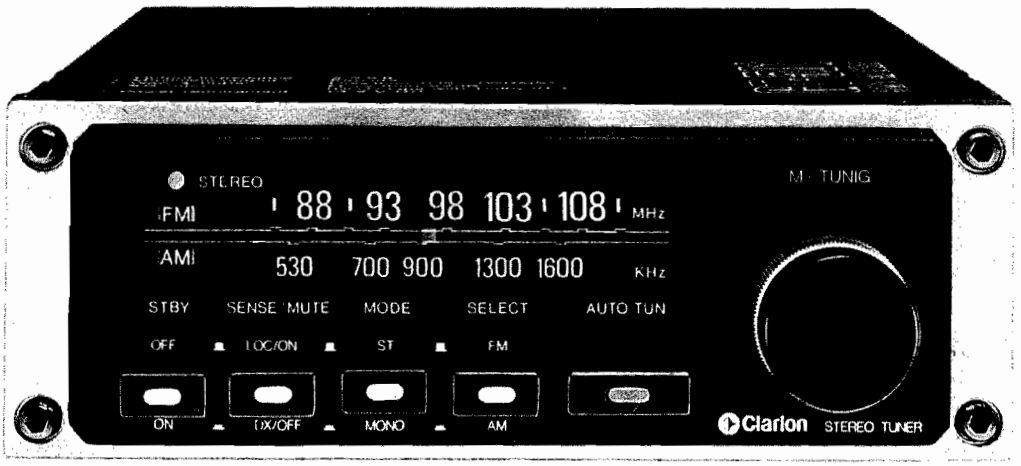


■SPECIFICATIONS:

FM Section

Receive frequency:	88MHz to 108MHz
Intermediate frequency:	10.7MHz
Practical sensitivity:	Less than 18dB (at 30dB S/N)
Image rejection ratio:	More than 40dB
IF rejection ratio:	More than 55dB
Stereo separation:	More than 20dB(1KHz)
Distortion:	Less than 3%
Muting:	20dB
Muting level:	Less than 10dB
Tuning indicator lighting level:	Less than 10dB
Frequency response:	30Hz to 12,000Hz
Auto stop sensitivity:	Lo···50dB Dx···23dB

AM Section

Receive frequency:	530KHz to 1,605KHz
Intermediate frequency:	452.5KHz
Practical sensitivity:	Less than 30dB (at 20dB S/N)
Image rejection ratio:	More than 54dB
IF rejection ratio:	More than 40dB
AGC:	More than 40dB
Distortion:	Less than 5%
Tuning indicator lighting level:	Less than 40dB
Auto stop sensitivity:	Lo···55dB Dx···35dB

Common

Rated output:	350mV (at 10KΩ load)
Output impedance:	Less than 1KΩ
Power source voltage:	14.0V (10.8V to 15.6V), ⊖ ground
Current consumption:	Less than 0.8A
Semiconductors:	5 ICs, 24 transistors, 20 diodes
Dimensions:	Width 140mm Height 50mm Depth 140mm
Weight:	1kg

Printed in Japan 298-2147-00 GT-501E

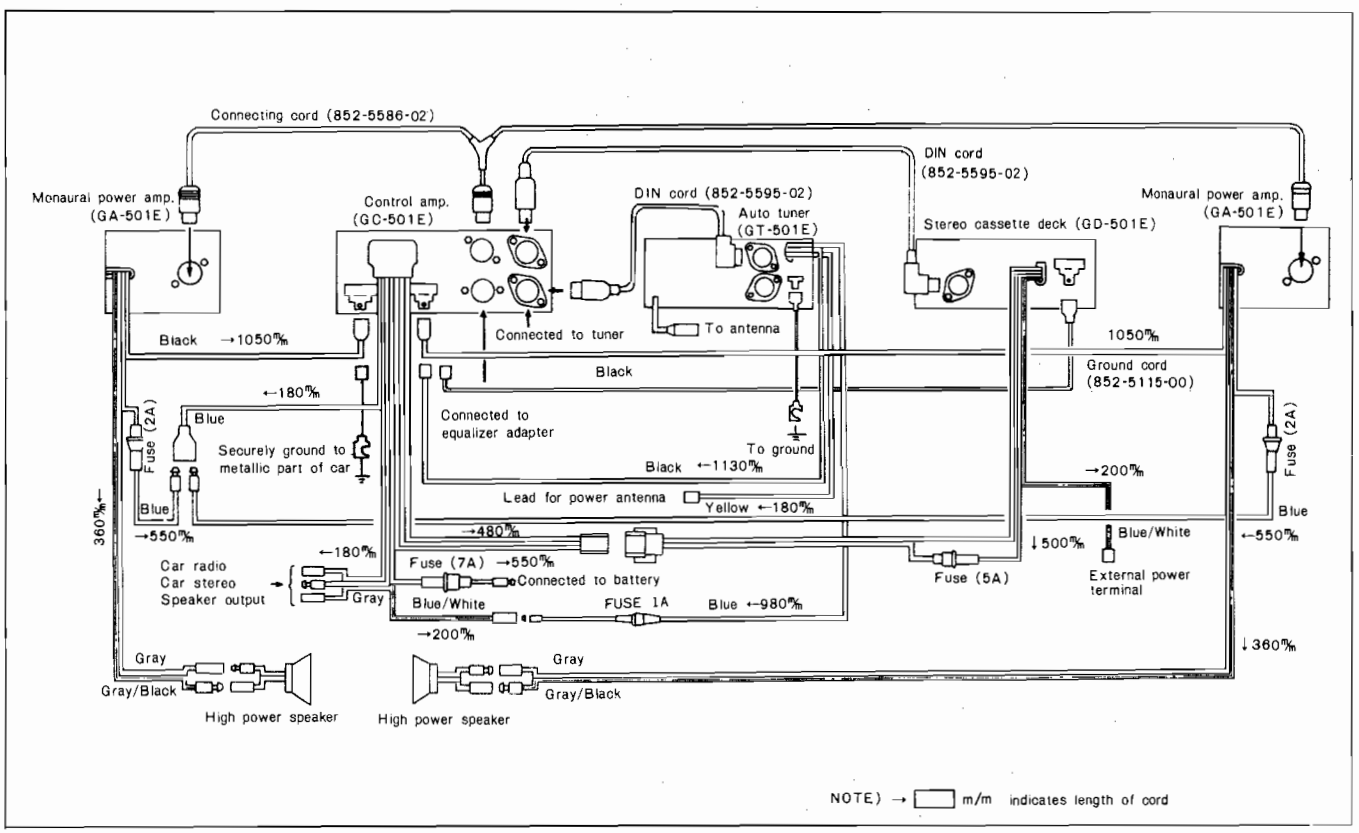
■COMPOSITION:

	Main body	1
	Accessories bag	1
	Documents bag	1
300-4976-00	Mounting bracket	1
300-5074-00	Mounting bracket	1
852-5595-02	DIN cord	1
852-5115-00	Ground cord	1

■FEATURES:

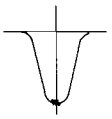
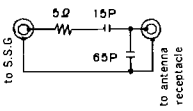
1) This is an exclusive AM/FM tuner for Clarion component car stereo specially designed and developed for use in cars.
2) Built-in Clean Z (noise killer circuit).
   By using this noise killer circuit developed by Clarion and called Clean Z, plug noise, wiper noise, etc. from own car and from other cars have been eliminated.
3) One-search system
   Band is changed and at the same time search and turning is accomplished by a single operation of pushing the AM/FM band selector switch.
   Convenient AM/FM indication. At the time of AM reception the indicator and dial pointer light in red color and at the time of FM reception in green color.
4) Digital type tuning check
   Tuning can be performed both manually and automatically. When tuning point is reached, dial pointer LED lights brighter.
5) Terminal for full auto antenna is provided and a wireless microphone can also be used.

■OVERALL CONNECTION DIAGRAM:

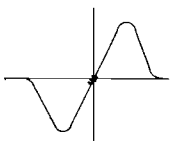
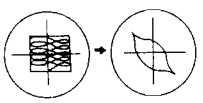


■ADJUSTMENT PROCEDURE:

AM

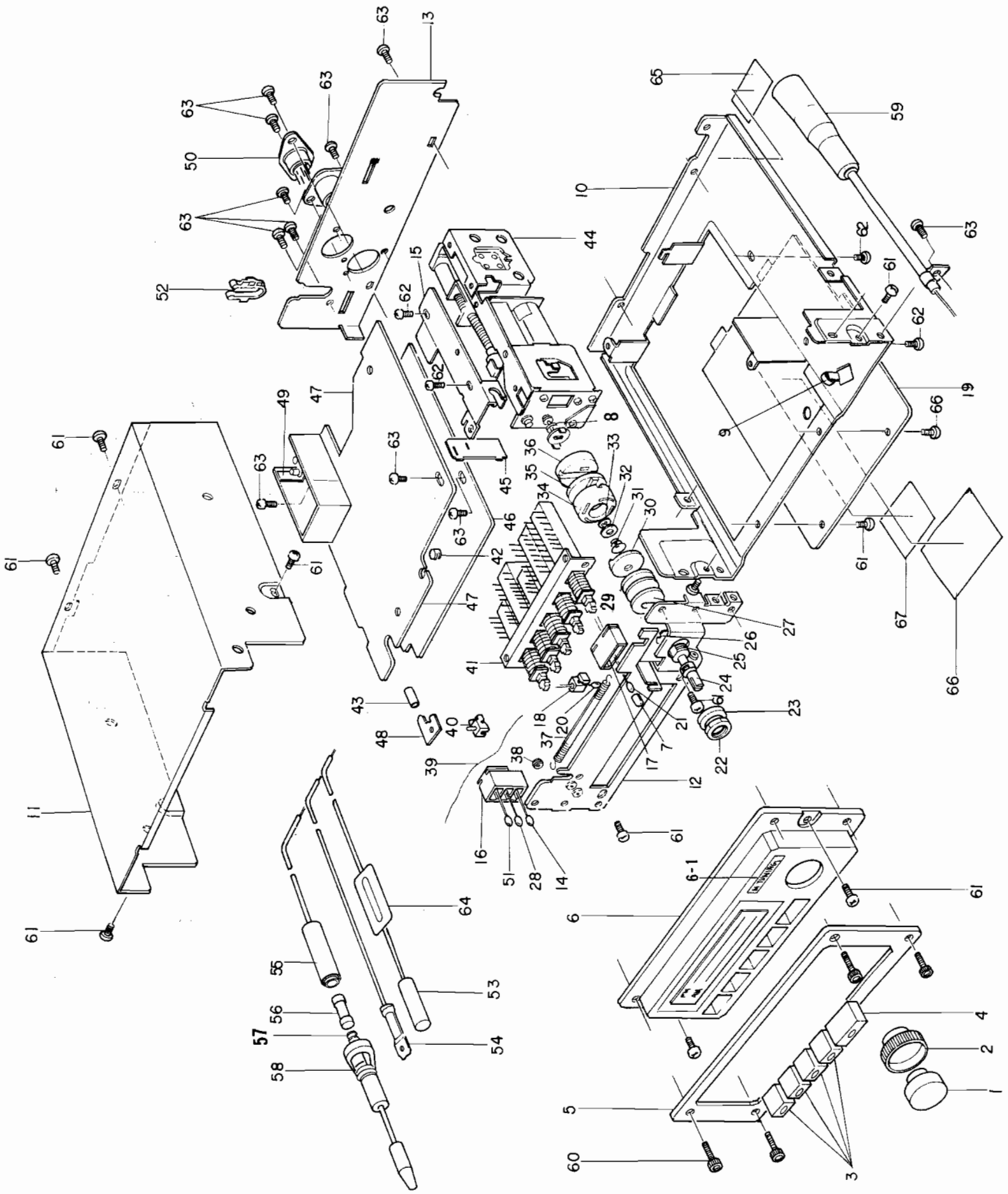
Adjustment Item	Signal Input Point	Adjustment Frequency	Signal Output Point	Adjustment Point	Method	Instrument	Remarks
IFT	TP_{201}	452.5KHz	TP_{202}	IFT_{201} IFT_{202}	Adjust for maximum height of IF curve with good symmetry.	●Sweep generator ●Oscilloscope	 Vol.: Min. Tone: Max.
Tracking	Antenna receptacle	Around 1650KHz 1400KHz 560KHz	Line output	TC_{203} L_{203} TC_{202} TC_{201}	Feed a signal of approx. 1650KHz and set the receiver dial pointer to the right end. Adjust TC_{203} for maximum deflection in millivoltmeter. Tune to 1400KHz. Adjust TC_{202}, TC_{201} for maximum deflection in millivoltmeter. Tune to 560KHz. Adjust L_{203} while changing frequency of S.S.G so that deflection in millivoltmeter becomes maximum. Again tune to 1400KHz. Adjust TC_{202}, TC_{201} for maximum deflection in millivoltmeter.	●S.S.G ●Speaker ●millivoltmeter	Dummy antenna  If tracking error at 600KHz, 1000KHz is large, readjust by TC_{203}.
<Trigger> IFT	TP_{201}	452.5KHz	TP_{301}	IFT_{203} IFT_{204}	Adjust for broad IF curve in the center.	●Sweep generator ●Oscilloscope	Remove the connection of the solid resistor (10KΩ) of the purple lead of the trigger section. Remove indicate ※ of P.W.B.
Stop sensitivity	Antenna receptacle	600KHz 1000KHz 1400KHz		VR_{201}	At Dx 24dB to 40dB At Lo 50dB to 70dB	SSG	

FM

Adjustment Item	Signal Input Point	Adjustment Frequency	Signal Output Point	Adjustment Point	Method	Instrument	Remarks
S curve	TP_1	10.7MHz	TP_2	IFT_3 IFT_4	Adjust so that the height of the upper and lower portions of the curve becomes maximum and the middle part of the curve becomes a straight line.	●Sweep generator ●Oscilloscope	
Tracking	Antenna receptacle	108MHz	Line output	RF and ANT trimmers in tuner pack	Adjust for maximum deflection in millivoltmeter	●S.S.G ●Speaker ●Millivoltmeter	
		87MHz	Line output	OSC trimmer	Bring the dial pointer at the left end and adjust for reception.		
<Trigger> IFT	TP_1	10.7MHz	TP_{301}	IFT_{105} IFT_{106}	Adjust for a wide curve, so that its center coincides with the center of the S curve.	●Sweep generator ●Oscilloscope	Same as for AM. Remove indicate ※ of P.W.B.
Stop sensitivity	Antenna receptacle	88MHz 98MHz 108MHz		VR_1	At Dx 18dB to 28dB At Lo 35dB to 60dB	●S.S.G.	
<MPX> VCO (Voltage controlled oscillator)	Antenna receptacle	19KHz	TP_{101}	VR_{303}	Adjust so that the lissajuous figure almost comes to rest.	●S.S.G stereo modulator	
Lighting sensitivity	Antenna receptacle	98MHz	TP_{101}	VR_{302}	Adjust so that the stereo indicator lights up at approx. 10dB or less.	●Millivoltmeter×2 ●Speaker×2	Before adjustment After adjustment
Noise suppressor circuit (CZ_1)	Since the noise suppressing circuit has been completely preadjusted with the help of special instruments, do not touch the core, semi-fixed resistors, etc. However, if pulse noise is found to be remarkably high in actual use in car, since adjustment of this circuit is likely to have been disturbed, adjust only VR_3 and VR_2. Noise is easy to suppress when VR_2 (3KΩ) is set near the middle position and VR_3 (30KΩ) is set towards the right side (clockwise direction). However, do not turn these VR's more than necessary.						

■EXPLODED VIEW:

◎Main section



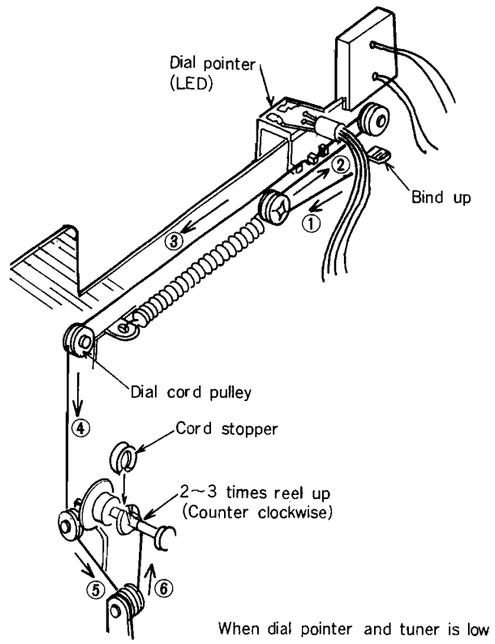
■PARTS LIST:

◎Main section

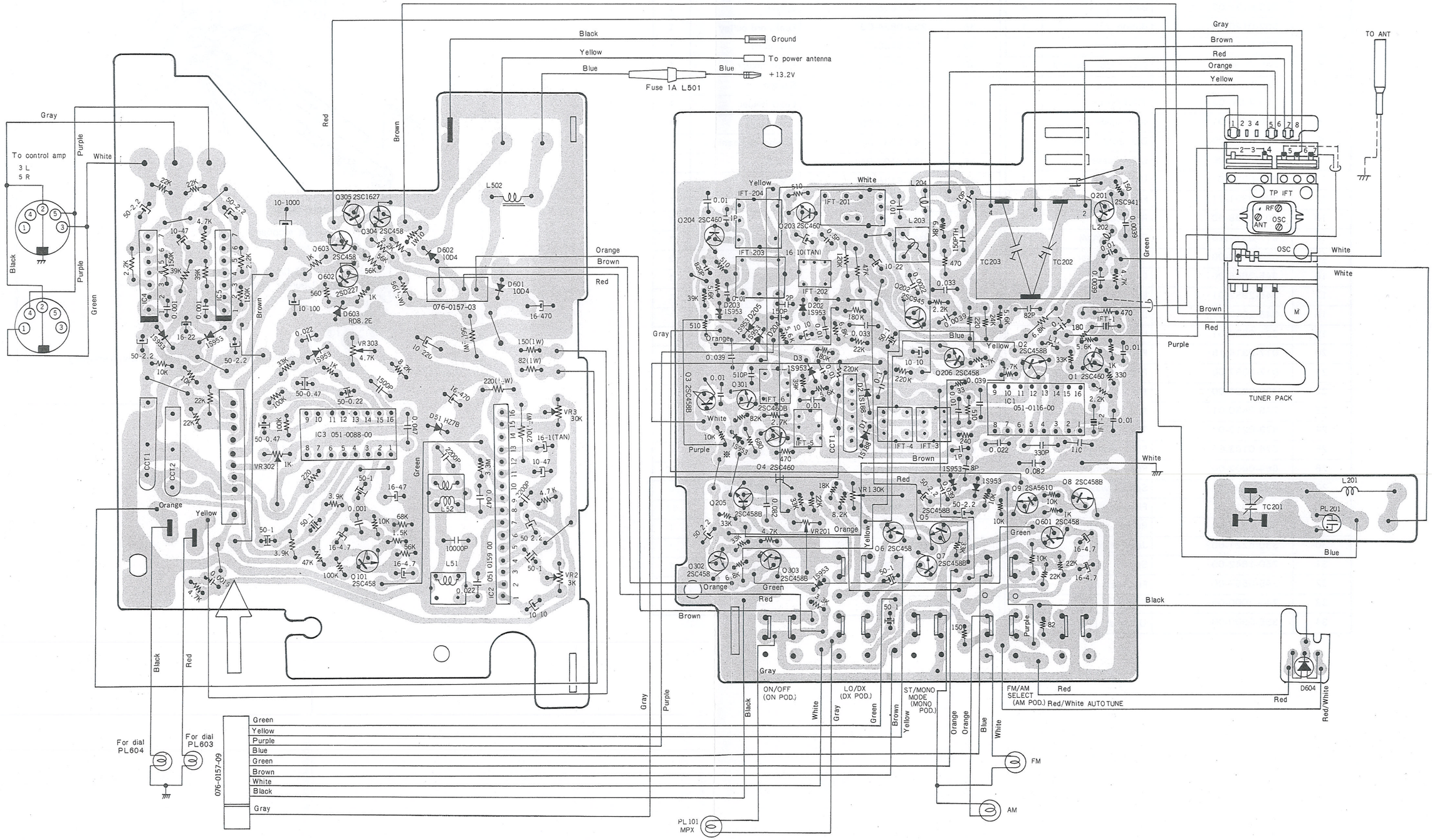
REF.NO.	PART NO.	DESCRIPTION	P.C.S
1	380-3772-00	Knob	1
2	380-3709-01	Knob	1
3	382-0131-00	Button	4
4	382-0140-00	Button	1
5	370-3116-00	Escutcheon	1
6	940-0161A	Escutcheon assembly	1
6-1	371-2761-00	Trim plate	1
7	345-2830-02	Pilot cover	1
8	746-0668-01	Flat washer	1
9	335-0530-00	Dial cord pulley	1
10	311-0947-00	Lower case	1
11	310-0934-01	Upper case	1
12	309-0331-01	Front plate	1
13	307-0288-00	Rear cover	1
14	017-0314-26	Pilotlamp(AM)	1
15	330-6456-00	P.W.B bracket	1
16	345-2946-00	Lamp holder	1
17	345-2952-01	Lamp holder	1
18	345-2947-01	Lamp holder	1
19	304-0304-01	Lower cover	1
20	017-0314-18	Pilotlamp(Dial)	1
21	017-0337-00	Pilotlamp(M-TUNING)	1
22	722-0231-00	Hex. nut	1
23	745-0430-01	Flat washer	1
24	673-0212-01	Tuning shaft	1
25	674-0103-00	Shaft bearing	1
26	684-0002-00	Plate spring	1
27	745-0568-00	Special washer	1
28	017-0314-27	Pilotlamp (FM)	1
29	345-2819-00	Rubber part	2
30	330-6221-00	Joint plate	1
31	750-1842-00	Spring	1
32	745-0567-00	Flat washer	1
33	743-2000-00	E-ring	1
34	335-0900-00	Universal joint A	1

REF.NO.	PART NO.	DESCRIPTION	P.C.S
35	335-0882-00	Universal joint B	1
36	335-0881-00	Universal joint C	1
37	750-1895-00	Spring	1
38	335-0894-00	Dial cord pulley	1
39	830-0400-91	Dial cord	1
40	335-0974-00	Point holder	1
41	013-3390-00	Switch	1
42	314-0387-00	Lead holder	1
43	825-0228-00	Vinyl tube	1
44	942 0237-00	Tuning mechanism	1
45	099-5102-01	P.W.B	1
46	099-5126-02	P.W.B	1
47	099-5127-02	P.W.B	1
48	099-5128-00	P.W.B	1
49	944-0512-00	Filter assembly	1
50	074-0480-00	Outlet socket	2
51	017-0324-05	Pilotlamp(ST)	1
52	335-0580-00	Lead holder	1
53	852-5322-00	Extension lead	1
54	850-1978-00	Earth lead	1
55	850-1822-00	A-lead	1
56	120-0010-03	Fuse(1A)	1
57	010-1610-00	Filter coil	1
58	850-1460-04	A-lead	1
59	092-0522-02	Antenna receptacle	1
60	716-0333-00	Decoration screw	4
61	731-3006-89	Taptight(M3x6)	12
62	714-3004-89	Machine screw (M3x4)	4
63	731-3006-80	Taptight(M3x6)	11
64	285-0779-01	Guide label	1
65	286-3678-00	Set plate	1
66	285-0778-02	Guide label	1
67	285-0656-00	Guide label	1

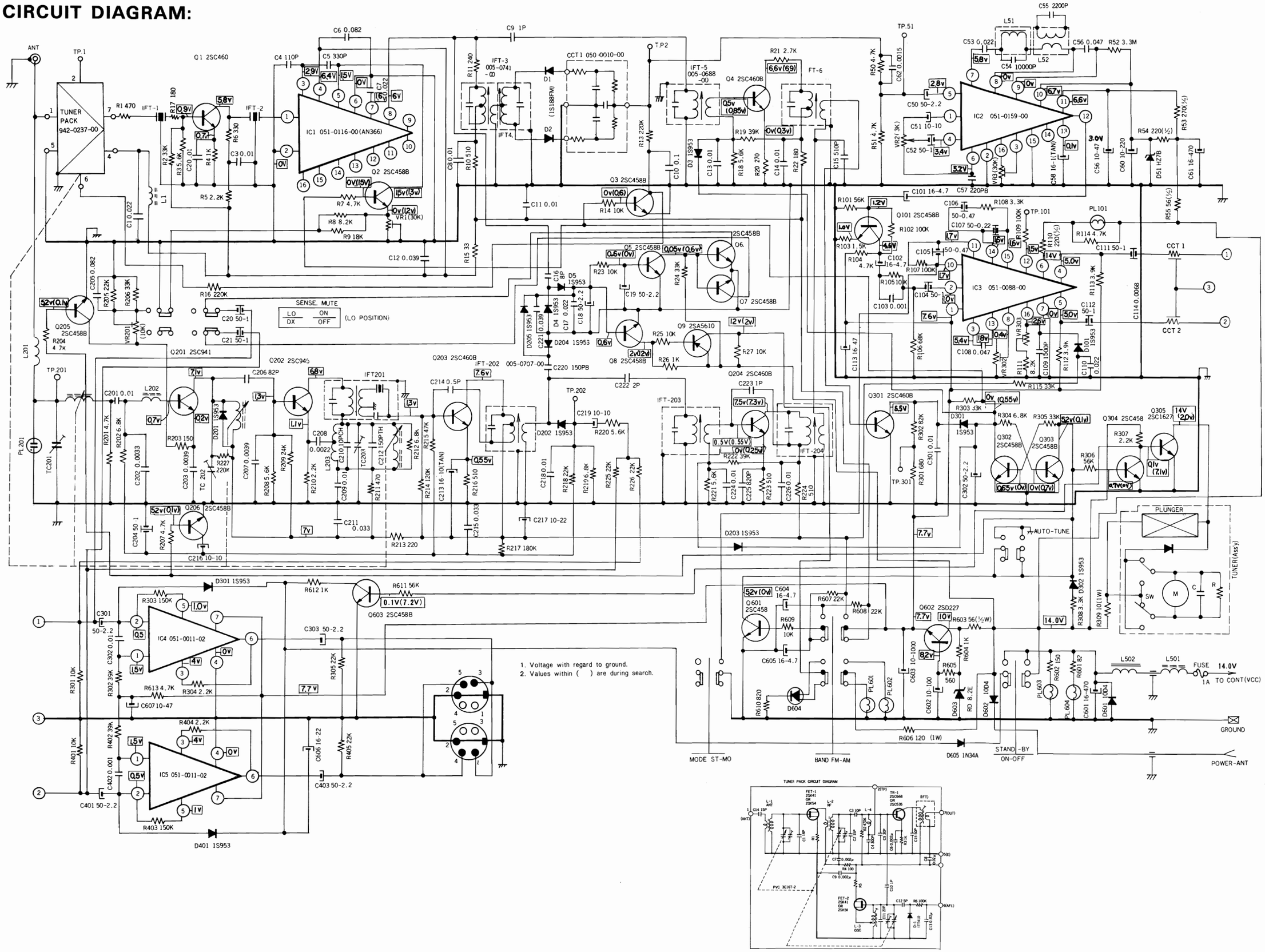
■METHOD OF INSTALLING THE CORD:



■PRINTED WIRING BOARD:



■CIRCUIT DIAGRAM:



1. Voltage with regard to ground.
2. Values within ( ) are during search.

TUNER PACK CIRCUIT DIAGRAM

◎Electrical section

REF.NO.	PART NO.	DESCRIPTION	P.C.S
$D_{601,602}$	001-0077-00	Diode(10D4)	2
D_{51}	001-0099-01	Diode(HZ7B)	1
$D_{202,203,204,205,301,302,401}^{3,4,5,101,201}$	001-0151-00	Diode(1S953)	12
D_{603}	001-0163-13	Diode(RD-8.2E)	1
D_{604}	001-0165-00	Diode	1
$D_{1,2}$	001-0180-00	Diode(1S188FM-1)	2
$TC_{202,203}$	004-1441-00	Trimmer	1
TC_{201}	004-1494-00	Trimmer	1
IFT_{204}	005-0801-00	IF-trans	1
IFT_{203}	005-0800-00	IF-trans	1
IFT_{5}	005-0688-00	IF-trans	1
IFT_{6}	005-0689-00	IF-trans	1
IFT_{202}	005-0707-00	IF-trans	1
IFT_{201}	005-0709-00	IF-trans	1
$IFT_{1,2}$	005-0724-00	Ceramic filter	2
IFT_{3}	005-0741-00	IF-trans	1
IFT_{4}	005-0766-00	IF-trans	1
L_{502}	009-0618-01	Choke	1
L_{201}	010-0490-01	Coil	1
L_{204}	010-0930-00	Coil	1
L_{202}	010-1030-01	Coil	1
L_{1}	010-1180-00	Coil	1
L_{203}	010-1699-00	Coil	1
L_{51}	010-1820-00	Coil	1
L_{52}	010-1821-00	Coil	1
VR_{201}	012-2740-00	Variable resistor (10KΩ)	1
VR_{2}	012-3170-03	Variable resistor (3KΩ)	1
VR_{3}	012-3170-04	Variable resistor (30KΩ)	1
VR_{1}	012-3249-00	Variable resistor (30KΩ)	1
VR_{302}	012-3286-00	Variable resistor (1KΩ)	1
VR_{303}	012-3395-00	Variable resistor (4.7KΩ)	1
	013-3390-00	Switch(operation SW)	1
PL_{201}	017-0321-01	Pilotlamp	1
C_{107}	042-0140-00	Electrolytic capacitor (50V0.22μF)	1
$C_{601,603}$	042-0173-00	Electrolytic capacitor (16V470μF)	2
C_{213}	042-0176-00	Electrolytic capacitor (16V10μF TAN)	1
C_{603}	042-0215-00	Electrolytic capacitor (10V1000μF)	1
C_{58}	042-0239-00	Electrolytic capacitor (16V1μF TAN)	1
C_{214}	043-0088-00	Ceramic capacitor (0.5PF)	1
CCT_{1}	050-0010-00	Component circuit	1
$CCT_{1,2}$	050-0051-00	Component circuit	2
IC_{1}	051-0116-00	IC(AN366)	1
$IC_{4,5}$	051-0011-02	IC(TA7063P)	2
IC_{3}	051-0088-00	IC(LA3350)	1
IC_{2}	051-0159-00	IC (CZ_{1})	1
Q_{9}	100-0561-15	Transistor (2SA561-O)	1
$Q_{205,206,302,303,304,601,603}^{2,3,5,6,7,8,101}$	102-0458-02	Transistor (2SC458B)	14

REF.NO.	PART NO.	DESCRIPTION	P.C.S
$Q_{204,301}^{1,4,203}$	102-0460-02	Transistor (2SC460B)	5
Q_{201}	102-0941-15	Transistor (2SC941-O)	1
Q_{202}	102-0945-16	Transistor (2SC945P)	1
Q_{602}	103-0227-18	Transistor (2SD227R)	1
Q_{305}	102-1627-25	Transistor (2SC1627Y)	1
R_{109}	110-1041-31	Solid resistor (¼W100KΩ)	1
R_{110}	110-2211-41	Solid resistor (½W220Ω)	1
R_{51}	110-4721-31	Solid resistor (¼W4.7KΩ)	1
$C_{59,607}$	180-4764-22	Electrolytic capacitor (VL10V47μF)	2
R_{301}	110-6811-31	Solid resistor (¼W680Ω)	1
R_{602}	114-1511-51	Film resistor (1W150Ω)	1
$R_{604,612}^{4,23,26}$	111-1021-32	Film resistor (¼W1KΩ)	5
$R_{105,301,401,609}^{14,23,25,27}$	111-1031-32	Film resistor (¼W10KΩ)	8
$R_{102,107}$	111-1041-32	Film resistor (¼W100KΩ)	2
R_{214}	111-1241-32	Film resistor (¼W120KΩ)	1
R_{203}	111-1511-32	Film resistor (¼W150Ω)	1
R_{103}	111-1521-32	Film resistor (¼W1.5KΩ)	1
$R_{303,403}$	111-1541-32	Film resistor (¼W150KΩ)	2
$R_{17,22}$	111-1811-32	Film resistor (¼W180Ω)	2
R_{9}	111-1831-32	Film resistor (¼W18KΩ)	1
R_{217}	111-1841-32	Film resistor (¼W180KΩ)	1
R_{213}	111-2211-32	Film resistor (¼W220Ω)	1
R_{54}	111-2211-42	Film resistor (½W220Ω)	1
$R_{5,304,307,404}$	111-2221-32	Film resistor (¼W2.2KΩ)	4
$R_{303,305,405,607,608}^{205,218,225,226}$	111-2231-32	Film resistor (¼W22KΩ)	9
$R_{13,16}$	111-2241-32	Film resistor (¼W220KΩ)	2
R_{11}	111-2411-32	Film resistor (¼W240Ω)	1
R_{209}	111-2431-32	Film resistor (¼W24KΩ)	1
R_{15}	111-3301-32	Film resistor (¼W33Ω)	1
$R_{6,12}$	111-3311-32	Film resistor (¼W330Ω)	2
R_{308}	111-3321-32	Film resistor (¼W3.3KΩ)	1
$R_{206,305}^{2,24,115}$	111-3331-32	Film resistor (¼W33KΩ)	5
$R_{52,108}$	111-3351-32	Film resistor (¼W3.3MΩ)	2
$R_{112,113}$	111-3921-32	Film resistor (¼W3.9KΩ)	2
$R_{19,222,302,402}$	111-3931-32	Film resistor (¼W39KΩ)	4
$R_{1,20,211}$	111-4711-32	Film resistor (¼W470Ω)	3
$R_{201,204,207,613}^{7,50,104,114}$	111-4721-32	Film resistor (¼W4.7KΩ)	8
R_{215}	111-4731-32	Film resistor (¼W47KΩ)	1
$R_{10,216,223,224}$	111-5111-32	Film resistor (¼W510Ω)	4
$R_{55,603}$	111-5601-42	Film resistor (½W56Ω)	2
R_{605}	111-5611-32	Film resistor (¼W560Ω)	1
$R_{220,221}^{3,18,208}$	111-5621-32	Film resistor (¼W5.6KΩ)	5
$R_{101,306,611}$	111-5631-32	Film resistor (¼W56KΩ)	3
$R_{202,212,219,304}$	111-6821-32	Film resistor (¼W6.8KΩ)	4
R_{106}	111-6831-32	Film resistor (¼W68KΩ)	1
R_{601}	111-8211-32	Film resistor (¼W820Ω)	1
$R_{8,111}$	111-8221-32	Film resistor (¼W8.2KΩ)	2

REF.NO.	PART NO.	DESCRIPTION	P.C.S
R_{302}	111-8231-32	Film resistor (¼W82KΩ)	1
R_{309}	114-1001-52	Film resistor (1W10Ω)	1
R_{606}	114-1211-51	Film resistor (1W120Ω)	1
D_{605}	001-0010-00	Diode(1N34A)	1
R_{53}	114-2711-42	Film resistor (½W270Ω)	1
R_{601}	114-8201-51	Film resistor (1W82Ω)	1
$C_{103,302,402}$	141-1023-11	Polyester capacitor (50V0.001μF)	3
$C_{54,201,209,218,226,301}^{2,3,8,11,13,14}$	141-1033-12	Polyester capacitor (50V0.01μF)	12
C_{62}	141-1523-11	Polyester capacitor (50V0.0015μF)	1
C_{208}	141-2223-11	Polyester capacitor (50V0.0022μF)	1
$C_{7,53,110}$	141-2233-13	Polyester capacitor (50V0.022μF)	3
$C_{211,215}$	141-3333-13	Polyester capacitor (50V0.033μF)	2
$C_{203,207}$	141-3923-11	Polyester capacitor (50V0.0039μF)	2
$C_{12,17,221}$	141-3933-13	Polyester capacitor (50V0.039μF)	3
$C_{56,108}$	141-4733-13	Polyester capacitor (50V0.047μF)	2
C_{15}	141-5112-11	Polyester capacitor (50V510PF)	1
$C_{114,115}$	141-6822-11	Polyester capacitor (50V0.0068μF)	2
$C_{6,205}$	141-8212-11	Polyester capacitor (50V820PF)	1
$C_{6,205}$	141-8233-15	Polyester capacitor (50V0.082μF)	2
C_{54}	143-1031-55	Polystylen capacitor (10000PF)	1
C_{109}	143-1521-51	Polystylen capacitor (1500PF)	1
$C_{1,10}$	043-0039-00	Ceramic capacitor (12V0.1μF)	2

REF.NO.	PART NO.	DESCRIPTION	P.C.S
C_{202}	141-3323-11	Polyester capacitor (50V0.0033μF)	1
C_{55}	143-2221-51	Polystylen capacitor (2200PF)	1
C_{4}	144-1112-14	Mica capacitor (50V110PF)	1
C_{5}	144-3312-17	Mica capacitor (50V330PF)	1
C_{206}	144-8202-10	Mica capacitor (50V82PF)	1
C_{210}	151-1007-13	Ceramic capacitor (10PF CH)	1
C_{9}	151-1096-13	Ceramic capacitor (1PF CH)	1
C_{222}	151-2096-13	Ceramic capacitor (2PF CH)	1
C_{16}	151-8096-13	Ceramic capacitor (8PF CH)	1
C_{212}	154-1512-50	Ceramic capacitor (150PF TH)	1
C_{220}	160-1512-05	Ceramic capacitor (150PF B)	1
C_{57}	160-2212-05	Ceramic capacitor (220PF B)	1
$C_{111,112,204}^{10,21,52,104}$	180-1054-62	Electrolytic capacitor (VL50V1μFN)	7
$C_{51,216,219}$	180-1064-22	Electrolytic capacitor (VL10V10μF)	3
C_{602}	180-1074-22	Electrolytic capacitor (VL10V100μF)	1
$C_{302,303,401,403}^{18,19,50,301}$	180-2254-62	Electrolytic capacitor (VL50V2.2μF)	8
C_{217}	180-2264-22	Electrolytic capacitor (VL10V22μF)	1
C_{606}	180-2264-32	Electrolytic capacitor (VL16V22μF)	1
C_{60}	180-2274-22	Electrolytic capacitor (VL16V220μF)	1
$C_{105,106}$	180-4744-62	Electrolytic capacitor (VL50V0.47μFN)	2
$C_{101,102,604,605}$	180-4754-32	Electrolytic capacitor (VL16V4.7μF)	4

■ADJUSTMENT OF ANTENNA TRIMMER:

Antenna trimmer must be adjusted in the following cases. It helps increasing the sensitivity.

- ○ After installing or after repairing the set.
- ○ When the antenna or the antenna cable is replaced.
- ○ When the radio sensitivity is poor and noise is prominent.

Method of adjustment

Set the receiver volume control to max., tone control to high and the dial pointer to around 1400KHz to receive white noise (hissing noise) and adjust the antenna trimmer (screw) so that the noise output becomes maximum.